SEQUENCE LISTING

<110> Nielsen, Anders Vikso
       Norman, Barrie Edmund
       Landvik, Sara

<120> Method for producing glucoamylases and their uses

<130> 10362.204-US

<160> 13

<170> PatentIn version 3.3

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tct gca cag tct gcg tct gcg aca gca tat ctt acc aag gaa tct gca      96
Ser Ala Gln Ser Ala Ser Ala Thr Ala Tyr Leu Thr Lys Glu Ser Ala
                20                  25                  30
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2

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gtt gcc aag aat ggc gta ctt tgc aac att ggt agc cag gga tgc atg        144
Val Ala Lys Asn Gly Val Leu Cys Asn Ile Gly Ser Gln Gly Cys Met
        35                  40                  45

tct gag ggt gcc tat agc ggt att gtg atc gca tct ccc tct aaa act        192
Ser Glu Gly Ala Tyr Ser Gly Ile Val Ile Ala Ser Pro Ser Lys Thr
        50                  55                  60

agc cct gac tat ctc t gtgagtatta tttgtaaagt agcctcactg atagtacatt      248
Ser Pro Asp Tyr Leu
65

ttctgagttc tgttacaacc ctggtattat aatag at   acc tgg act cgc gac        300
                                           Tyr Thr Trp Thr Arg Asp
                                                                75

tcg tcg ctc gtc ttc aag atg tta att gac caa tac aca aat ggc ctg        348
Ser Ser Leu Val Phe Lys Met Leu Ile Asp Gln Tyr Thr Asn Gly Leu
            80                  85                  90

gat acg gtatgtggca tcngcgttcc ggctcgcctc aaagatgnaa aattgatgtt         404
Asp Thr

tcttag aca ctg cgc act ctc att gac gag ttt gtc tct gcg gaa gcc        452
       Thr Leu Arg Thr Leu Ile Asp Glu Phe Val Ser Ala Glu Ala
            95                  100                 105

acc att caa caa acc agt aac cca tct ggt acc gtc tct acc ggt ggt        500
Thr Ile Gln Gln Thr Ser Asn Pro Ser Gly Thr Val Ser Thr Gly Gly
        110                 115                 120

ctc ggc gaa ccc aaa ttc aat atc gac gag acg gca ttt acg ggc gca        548
Leu Gly Glu Pro Lys Phe Asn Ile Asp Glu Thr Ala Phe Thr Gly Ala
        125                 130                 135

tgg ggt cgt gtaagctacc aatacacaat caaaatcgac catctgtatt               597
Trp Gly Arg
140

tactatctat aatttctag ccc caa cgt gat ggt ccc gcc ctc cgt gca acc       649
                     Pro Gln Arg Asp Gly Pro Ala Leu Arg Ala Thr
                         145                 150

gca atc atg acc tat gcg acg tat ctg tac aac aat ggc aac act tcc        697
Ala Ile Met Thr Tyr Ala Thr Tyr Leu Tyr Asn Asn Gly Asn Thr Ser
        155                 160                 165

tac gtg acc aac acc ctt tgg cct atc atc aag ctc gac ctt gac tat        745
Tyr Val Thr Asn Thr Leu Trp Pro Ile Ile Lys Leu Asp Leu Asp Tyr
170                 175                 180                 185

gtc aac tcg gac tgg aac cag acc a gtaagcgaat ttctaggggg               790
Val Asn Ser Asp Trp Asn Gln Thr
                190
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acttatctaa aacagcatat tcaaccagta aatag cg  ttt gac ctc tgg gaa        842
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gaa gtt gac tcg tct tct ttc ttt acg act gcc gtt cag cac cgt gct        890
Glu Val Asp Ser Ser Ser Phe Phe Thr Thr Ala Val Gln His Arg Ala
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ctt gtt cag ggc gca gcc ttt gct acc ctc atc ggc caa act tcg tct        938
Leu Val Gln Gly Ala Ala Phe Ala Thr Leu Ile Gly Gln Thr Ser Ser
                220             225             230


gct tcg act tac tcc gcc acg gcc cct agc att ctc tgc ttc ttg cag        986
Ala Ser Thr Tyr Ser Ala Thr Ala Pro Ser Ile Leu Cys Phe Leu Gln
            235             240             245


gtgagataaa aatctttcta tgtaattggt ttttcccctc aaattgaaat tgacatattt      1046


gcgatccaat ag tct tac tgg aac acc aac gga tac tgg acg gcc aac act      1097
               Ser Tyr Trp Asn Thr Asn Gly Tyr Trp Thr Ala Asn Thr
               250             255             260


ggt ggc gga cgt tcc ggc aag gac gcc aac acc ata ctc gct tct atc       1145
Gly Gly Gly Arg Ser Gly Lys Asp Ala Asn Thr Ile Leu Ala Ser Ile
                265             270             275


cac aca ttt gac gcc agc gcc ggc tgc tct gct gcc acg tct caa cca       1193
His Thr Phe Asp Ala Ser Ala Gly Cys Ser Ala Ala Thr Ser Gln Pro
                280             285             290


tgc tct gac gta gca ttg gcc aac ctg aag gta tac gtt gac tct ttc       1241
Cys Ser Asp Val Ala Leu Ala Asn Leu Lys Val Tyr Val Asp Ser Phe
            295             300             305


cgt agt att tat acg atc aac agc ggt att tcc tct acc tcg ggt gtt       1289
Arg Ser Ile Tyr Thr Ile Asn Ser Gly Ile Ser Ser Thr Ser Gly Val
    310             315             320


gct act ggt cgc tac ccc gaa gat tcg tat tac aat ggc aac               1331
Ala Thr Gly Arg Tyr Pro Glu Asp Ser Tyr Tyr Asn Gly Asn
325             330             335


gtacgtattt atctaatttt tccaagacag tcaaagttta tgttcatctg cccccttta      1391


cctgtacatt caaaatag ccc tgg tac ctc tgc aca ctc gcc gtc gcc gag       1442
                    Pro Trp Tyr Leu Cys Thr Leu Ala Val Ala Glu
                    340             345


cag ctc tat gat gct ctc atc gta tgg aag gct gcc ggg gag ctc aac       1490
Gln Leu Tyr Asp Ala Leu Ile Val Trp Lys Ala Ala Gly Glu Leu Asn
350             355             360             365


gtc acc tcc gtc tcg ctc gcg ttc ttc cag caa ttc gac tcg agc atc       1538
Val Thr Ser Val Ser Leu Ala Phe Phe Gln Gln Phe Asp Ser Ser Ile
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acc gcc ggc act tac gcc tcc tcg tcg agc gta tac act tcg ctc atc       1586
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Ser Asp Ile Gln Ala Phe Ala Asp Glu Phe Val Asp Ile Val Ala Lys
            400                 405                  410


tac acg cct tcg tct ggc ttc ttg tct gag cag tat gat aag tcc acg      1682
Tyr Thr Pro Ser Ser Gly Phe Leu Ser Glu Gln Tyr Asp Lys Ser Thr
            415                 420                 425


ggt gct cag gat tcg gct gct aac ttg act t gtaagtcatc tatttgttca      1733
Gly Ala Gln Asp Ser Ala Ala Asn Leu Thr
430                 435


ttctattcct tttcaaaaaa aaaagtgatg ctaatgattt ttggcggaaa ccag gg       1789
                                                               Trp


tcc tat gct gct gct atc acc gct tac caa gcc cgc aat ggc ttc aca      1837
Ser Tyr Ala Ala Ala Ile Thr Ala Tyr Gln Ala Arg Asn Gly Phe Thr
                445                 450                 455


ggt gct tcg tgg ggt gct aag gga gtt tct acc tcc tgc tcg act ggt      1885
Gly Ala Ser Trp Gly Ala Lys Gly Val Ser Thr Ser Cys Ser Thr Gly
            460                 465                 470


gct aca agc ccg ggt ggc tcc tcg ggt agt gtc gag gtc act ttc gac      1933
Ala Thr Ser Pro Gly Gly Ser Ser Gly Ser Val Glu Val Thr Phe Asp
            475                 480                 485


gtt tac gct acc aca gta tat ggc c gtaagcactt gactagcttc             1978
Val Tyr Ala Thr Thr Val Tyr Gly
        490                 495


aaaccatact tcatcatgct gataaacaaa aaaatgaaac ag ag  aac atc tat       2031
                                                  Gln Asn Ile Tyr
                                                              500


atc acc ggt gat gtg agt gag ctc ggc aac tgg aca ccc gcc aat ggt      2079
Ile Thr Gly Asp Val Ser Glu Leu Gly Asn Trp Thr Pro Ala Asn Gly
            505                 510                 515


gtt gca ctc tct tct gct aac tac ccc acc tgg agt g gtaagttgac         2126
Val Ala Leu Ser Ser Ala Asn Tyr Pro Thr Trp Ser
            520                 525


ccttaccagt atcttgacag acattgatat tgacttccgc aatacag cc  acg atc      2181
                                                      Ala Thr Ile
                                                              530


gct ctc ccc gct gac acg aca atc cag tac aag tat gtc aac att gac      2229
Ala Leu Pro Ala Asp Thr Thr Ile Gln Tyr Lys Tyr Val Asn Ile Asp
            535                 540                 545


ggc agc acc gtc atc tgg gag gat gct atc agc aat cgc gag atc acg      2277
Gly Ser Thr Val Ile Trp Glu Asp Ala Ile Ser Asn Arg Glu Ile Thr


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acg ccc gcc agc ggc aca tac acc gaa aaa gac act tgg gat gaa tct    2325
Thr Pro Ala Ser Gly Thr Tyr Thr Glu Lys Asp Thr Trp Asp Glu Ser
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taaactgctg aacttgaacg gcttgcaaaa gcgaatggtg tagaaaataa acgaagattt    2385

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        35                  40                  45


Ser Glu Gly Ala Tyr Ser Gly Ile Val Ile Ala Ser Pro Ser Lys Thr
    50                  55                  60


Ser Pro Asp Tyr Leu Tyr Thr Trp Thr Arg Asp Ser Ser Leu Val Phe
65                  70                  75                  80


Lys Met Leu Ile Asp Gln Tyr Thr Asn Gly Leu Asp Thr Thr Leu Arg
                85                  90                  95


Thr Leu Ile Asp Glu Phe Val Ser Ala Glu Ala Thr Ile Gln Gln Thr
            100                 105                 110


Ser Asn Pro Ser Gly Thr Val Ser Thr Gly Gly Leu Gly Glu Pro Lys
        115                 120                 125


Phe Asn Ile Asp Glu Thr Ala Phe Thr Gly Ala Trp Gly Arg Pro Gln
    130                 135                 140


Arg Asp Gly Pro Ala Leu Arg Ala Thr Ala Ile Met Thr Tyr Ala Thr
145                 150                 155                 160
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Tyr Leu Tyr Asn Asn Gly Asn Thr Ser Tyr Val Thr Asn Thr Leu Trp
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Pro Ile Ile Lys Leu Asp Leu Asp Tyr Val Asn Ser Asp Trp Asn Gln
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Thr Thr Phe Asp Leu Trp Glu Glu Val Asp Ser Ser Ser Phe Phe Thr
            195   200   205

Thr Ala Val Gln His Arg Ala Leu Val Gln Gly Ala Ala Phe Ala Thr
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Leu Ile Gly Gln Thr Ser Ser Ala Ser Thr Tyr Ser Ala Thr Ala Pro
225   230   235   240

Ser Ile Leu Cys Phe Leu Gln Ser Tyr Trp Asn Thr Asn Gly Tyr Trp
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Thr Ala Asn Thr Gly Gly Gly Arg Ser Gly Lys Asp Ala Asn Thr Ile
            260   265   270

Leu Ala Ser Ile His Thr Phe Asp Ala Ser Ala Gly Cys Ser Ala Ala
    275   280   285

Thr Ser Gln Pro Cys Ser Asp Val Ala Leu Ala Asn Leu Lys Val Tyr
    290   295   300

Val Asp Ser Phe Arg Ser Ile Tyr Thr Ile Asn Ser Gly Ile Ser Ser
305   310   315   320

Thr Ser Gly Val Ala Thr Gly Arg Tyr Pro Glu Asp Ser Tyr Tyr Asn
            325   330   335

Gly Asn Pro Trp Tyr Leu Cys Thr Leu Ala Val Ala Glu Gln Leu Tyr
            340   345   350

Asp Ala Leu Ile Val Trp Lys Ala Ala Gly Glu Leu Asn Val Thr Ser
    355   360   365

Val Ser Leu Ala Phe Phe Gln Gln Phe Asp Ser Ser Ile Thr Ala Gly
    370   375   380

7

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Thr Tyr Ala Ser Ser Ser Ser Val Tyr Thr Ser Leu Ile Ser Asp Ile
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Gln Ala Phe Ala Asp Glu Phe Val Asp Ile Val Ala Lys Tyr Thr Pro
            405             410                     415


Ser Ser Gly Phe Leu Ser Glu Gln Tyr Asp Lys Ser Thr Gly Ala Gln
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Asp Ser Ala Ala Asn Leu Thr Trp Ser Tyr Ala Ala Ala Ile Thr Ala
        435             440             445


Tyr Gln Ala Arg Asn Gly Phe Thr Gly Ala Ser Trp Gly Ala Lys Gly
    450             455             460


Val Ser Thr Ser Cys Ser Thr Gly Ala Thr Ser Pro Gly Gly Ser Ser
465             470             475                     480


Gly Ser Val Glu Val Thr Phe Asp Val Tyr Ala Thr Thr Val Tyr Gly
            485             490                 495


Gln Asn Ile Tyr Ile Thr Gly Asp Val Ser Glu Leu Gly Asn Trp Thr
            500             505             510


Pro Ala Asn Gly Val Ala Leu Ser Ser Ala Asn Tyr Pro Thr Trp Ser
        515             520             525


Ala Thr Ile Ala Leu Pro Ala Asp Thr Thr Ile Gln Tyr Lys Tyr Val
    530             535             540


Asn Ile Asp Gly Ser Thr Val Ile Trp Glu Asp Ala Ile Ser Asn Arg
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